* * REASONS FOR AMENDMENTS AND REMARKS * *

Applicants wish to acknowledge with appreciation the Examiner's analysis and efforts in examining this application. The Office Action of June 19, 2007, has been thoroughly studied. A sincere and earnest effort to respond to the Examiner's Office Action has been made by Applicants. Accordingly, reconsideration and allowance of the subject claims is respectfully requested.

I. Claim Amendments

Claim 8 has been cancelled without prejudice. New Claims 15-17 have been added. Accordingly, Claims 1-7 and 9-17 are currently pending.

II. Rejections Under 35 U.S.C. § 122, Second Paragraph

Claims 1-6 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the claims were directed to a method, but did not contain any method steps. These claims were intended to be system claims and have been amended accordingly. This corrects a typographical error in these claims and is not narrowing in nature.

III. Rejections Under 35 U.S.C. § 102(b)

Claims 7-8 were rejected under 35 U.S.C. § 102(b) as anticipated by Shah. As amended, Claim 7 recites a method for determining the enantiomeric excess of chiral molecule in a solution having a plurality of molecular species. The method includes the step of obtaining a concentration coefficient from an IR spectrum for each molecular species in the solution. The apparent concentration coefficient of the VCD spectrum is obtained for each molecular species in the solution simultaneously with the step of obtaining a concentration coefficient from the IR spectrum. The apparent concentration coefficient of the VCD spectrum is divided by the concentration coefficient from the IR spectrum for each molecular species present in the solution to obtain a %EE for each of the molecular species. In the event that amended Claim 7 is rejected based on Shah, such a rejection would be respectfully traversed.

The Shah reference involves the idea of obtaining %EE for a ***single*** species from a division of the entire VCD spectrum by the entire IR spectrum for a single species in a ***static*** set of measures. See Shah at 770 ("The case illustrated above was for the detection of percentage ee of a ***single component at constant concentration***, in which the determination of percentage ee was simple and straightforward.") (emphasis added). As discussed above, amended Claim 7 includes the step of obtaining a %EE for each molecular species in the solution (i.e., a multi-component solution). As discussed above, Shah obtains %EE for a single molecular species, which is in stark contrast to obtaining the %EE for multiple species, as recited in Claim 7.

Furthermore, amended Claim 7 requires simultaneously obtaining the IR spectrum and VCD spectrum for the plurality of molecular species to obtain the %EE for multiple species.

The Shah reference merely speculates that simultaneous determination of %EE for multiple species could be obtained in a straightforward manner:

> An additional advantage of using VCD and ROA is the potential to analyze the composition and percentage ee of a two-component (or, in principle, even a multi-component) system, such as reactant and product. The IR spectrum is used to determine the concentration of each species by chemometric methods. The percentage ee of each species can be revealed by dividing the apparent concentration of the observed VCD spectra of each component by the IR concentration simultaneously, without the need for separation of the compounds. Application of this methodology to real-time analysis of slowly evolving chemical reactions of chiral molecules of varying percentage ee is straightforward.

This statement in Shah turned out to be incorrect (i.e., not straightforward). Dr. Laurence A. Nafie, one of the inventors of the present invention, is a co-author of the Shah reference. Attached is a declaration by Dr. Nafie indicating that the Shah reference is inoperable regarding simultaneously obtaining %EE for multiple molecular species. See MPEP § 716.07.

Therefore, Applicants respectfully assert that amended Claim 7 should be allowed.

IV. Rejections Under 35 U.S.C. § 103(a)

Claims 1-4, 9 and 11-14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Shah, in view of Chickos, Cianciosi, Freedman or Setnicka. These rejections are respectfully traversed.

To establish a *prima facie* case of obviousness, the Examiner must show that the combined references teach or suggest all claim limitations. See MPEP § 2143.03. In rejecting Claims 1-4, 9 and 11-14, the Examiner relied on Shah as the primary reference; however, the Examiner's discussion regarding Shah is limited to Claims 7-8. In rejecting Claims 1-4, 9 and 11-14, the Examiner merely refers to the analysis of Claims 7-8 regarding Shah, without providing any explanation regarding the limitations of Claims 1-4, 9 and 11-14: "Claims 1-4, 9 and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shah **as applied to claims 7-8 above**, ..." Office Action of 6/19/2007 at 3 (emphasis added). Attorney for Applicants recognizes that the use of the phrase "as applied to claims ..." is a common practice when discussing an obviousness rejection of a dependent claim after an explanation regarding an independent claim has been provided. However, that is not the case here. Claims 1-4, 9 and 11-14 do not depend, directly or indirectly, on either Claim 7 or Claim 8. Indeed, Claims 1, 2 and 9 are all independent claims.

According to MPEP 2143.03, "All words in a claim must be considered in judging the patentability of that claim against the prior art." Here, the Examiner failed to establish a *prima facie* case of obvious because there was no consideration of the limitations in Claims 1-4, 9 and 11-14. For example, there is no indication regarding the elements in Claims 1 and 2 of the "means for analyzing said Fourier transform vibrational circular dichroism spectra and absorption to determine simultaneously the concentration and enantiomeric excess of each chiral molecule as a function of time." Applicants respectfully submit that the simultaneous determination of concentration and enantiomeric excess of *each* chiral molecule in a *plurality* of chiral molecules participating in a chemical reaction, as recited in Claims 1 and 2, is not taught or suggested by Shah. Moreover, the step recited in Claim 9 of "dividing the apparent concentration coefficient of each species present in the VCD spectrum by the corresponding concentration coefficient of each species in the IR spectrum" is not taught or suggested by Shah. As discussed above, Shah involves the determination of %EE for a ***single*** species in a ***static*** set of measures. See Shah at 770 ("The case illustrated above was for the detection of percentage ee of a ***single component at constant concentration***, in which the determination of percentage ee was simple and straightforward.") (emphasis added).

The Examiner's lack of analysis regarding Claims 1-4, 9 and 11-14 also violates 37 C.F.R. 1.104(c)(2), which provides:

> When a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable. The pertinence of each reference, if not apparent, must be clearly explained and each rejected claim specified.

Here, the Shah reference is clearly complex. However, the pertinence of the Shah reference for each rejected claim (i.e., 1-4, 9 and 11-14) was not explained. As discussed above, there are numerous limitations in Claims 1-4, 9 and 11-14 that are not taught or suggested by Shah. The Examiner failed to provide any explanation as to where these limitations are allegedly found in Shah. Accordingly, for at least these reasons, Claims 1-4, 9 and 11-14 should be allowed.

The Examiner rejected Claims 5-6 and 10 under 35 U.S.C. 103(a) as being unpatentable over Shah, in view of Chickos, Cianciosi, Freedman or Setnicka, further in view of Edelmann. These rejections are respectfully traversed.

The Examiner acknowledges that Shah "does not teach the use of optical fibers to carry the light to and from the sample undergoing reaction," but asserts that this is obvious in view of Edelmann. As discussed in the present application, the extension of fiber optics "to monitoring %EE is not obvious because of problems associated with the control of circular polarization through the fibers." Application at ¶ 37. New claims 15 and 16 are directed to specific techniques for dealing with this issue. Accordingly, Applicants respectfully request allowance of these claims.

V. Claim 17

Applicants have added new Claim 17, which is directed to a method for determining the enantiomeric excess of chiral molecule in a solution. Of particular note, this method includes the step of "determining a %EE based solely on the VCD spectrum, without obtaining an IR spectrum for the solution." This is not taught or suggested in Shah or any other reference of record.

VI. Conclusion

To the extent necessary, a petition for an extension of time under 37 C.F.R. §1.136 is hereby made. To the extent additional fees are required, please charge the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 02-1010 (35203/94789) and please credit any excess fees to such deposit account.

Respectfully submitted,

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